

PRODUCT INFORMATION



(±)-3-Methyl-2-oxovaleric Acid (sodium salt)

Item No. 43920

CAS Registry No.: 3715-31-9

Formal Name: 3-methyl-2-oxo-pentanoic acid, monosodium salt

Synonyms: (±)-2-keto-3-Methylpentanoic Acid,
(±)-2-keto-3-Methylvalerate,
(±)-3-methyl-2-Oxopentanoic Acid,
DL-α-keto β-Methylvaleric Acid,
DL-KMV

MF: C₆H₉O₃ • Na

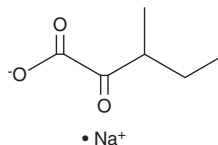
FW: 152.1

Purity: ≥95%

Supplied as: A solid

Storage: -20°C

Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

(±)-3-Methyl-2-oxovaleric acid (sodium salt) is supplied as a solid. A stock solution may be made by dissolving the (±)-3-methyl-2-oxovaleric acid (sodium salt) in the solvent of choice, which should be purged with an inert gas. (±)-3-Methyl-2-oxovaleric acid (sodium salt) is sparingly soluble (1-10 mg/ml) in DMSO.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of (±)-3-methyl-2-oxovaleric acid (sodium salt) can be prepared by directly dissolving the solid in aqueous buffers. (±)-3-Methyl-2-oxovaleric acid (sodium salt) is soluble (≥10 mg/ml) in PBS (pH 7.2). We do not recommend storing the aqueous solution for more than one day.

Description

(±)-3-Methyl-2-oxovaleric acid is a racemic mixture of (S)-(+)- and (R)-(-)-3-methyl-2-oxovaleric acid. (S)- and (R)-3-Methyl-2-oxovaleric acid are products of L-leucine (Item No. 34342) and L-alloisoleucine (Item No. 34904) catabolism, respectively.^{1,2} Dietary supplementation of (±)-3-methyl-2-oxovaleric acid leads to lower food consumption and weight gain compared with isoleucine supplementation.³ (±)-3-Methyl-2-oxovaleric acid accumulates in the tissues and body fluids of patients with maple syrup urine disease (MSUD), an inborn error of metabolism characterized by branched-chain α-keto acid dehydrogenase (BCKAD) deficiency that leads to progressive ketoacidosis, failure to thrive, neurological dysfunction, and, potentially, death.^{4,5} (±)-3-Methyl-2-oxovaleric acid is the cause of the characteristic maple syrup odor that appears in the urine, sweat, and ear wax of infants with MSUD.

References

1. Sewell, A.C., Heil, M., Podedbrad, F., *et al.* *Eur. J. Pediatr.* **157**(3), 185-191 (1998).
2. Podedbrad, F., Heil, M., Leib, S., *et al.* *J. High Resol. Chromatogr.* **20**(7), 355-362 (1997).
3. Funk, M.A., Lowry, K.R., and Baker, D.H. *J. Nutr.* **117**(9), 1550-1555 (1987).
4. Matsumoto, I. and Kuhara, T. Inborn Errors of Amino Acid and Organic Acid Metabolism. Mass Spectrometry. Modern Analytical Chemistry Springer, 259-298 (1992).
5. Farias, H.R., Gabriel, J.R., Cecconi, M.L., *et al.* *Metab. Brain Dis.* **36**(1), 185-192 (2021).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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